

*elliotti* (m), *P. quadrimaculatum* (1 m), *P. nebrascensis* (Thomas) (V), and *T. kiowa* (3 m). At DCP they preyed upon *A. clavatus* (f) and *A. deorum* (f), and at HH upon *A. deorum* (f) and *Melanoplus gladstoni* Scudder (IV). The other prey taken by this species included two conspecifics, one *Megaphorus willistoni* (Williston) (Asilidae), one sarcophagid fly, and one crambine moth (Pyralidae). *Scleropogon coyote* prey selection did not strongly overlap that of the other predators. Unlike the *Efferia* and *Machimus*, whose prey were 94% nymphs, 80% of the prey of *S. coyote* were adults ( $n = 10$ ). In addition, six of eight of the adult prey of *S. coyote* were males, while all 11 of *Prionyx* prey were females.

Although robber flies have some potential for significant impact on grasshopper populations (Joern & Rudd 1982), many robber flies also prey on natural enemies of acridids, thus potentially counterbalancing any positive economic impact (Rees, N. E. & J. A. Onsager. 1985. Environ. Entomol., 4: 20–23). At the study sites, I observed robber flies preying on species of Sarcophagidae, Bombyliidae, Asilidae, and Sphecidae that are known to attack grasshoppers. Furthermore, most asilids readily switch prey preferences as the local abundance of potential prey changes (O'Neill 1992). The sphecid species discussed here may be more specialized upon acridids, but their impact on grasshopper populations will be difficult to measure because their prey choice and activities are more difficult to observe than those of asilids.

*Acknowledgment.* —I thank the following for identifying specimens: Howard E. Evans (Sphecidae), Eric Fisher and C. Riley Nelson (Asilidae), and Jeffrey Holmes (Acrididae). Ruth O'Neill and Kathleen Johnson provided assistance in the field. Cathy Seibert and William Kemp provided comments on the manuscript. This work was supported by USDA/ARS, USDA/APHIS-PPQ, and the Montana Agricultural Experiment Station. Contribution J-2927 from the Montana Agricultural Experiment Station.

Kevin M. O'Neill, *Department of Entomology, Montana State University, Bozeman, Montana 59717.*

PAN-PACIFIC ENTOMOLOGIST  
71(4): 250–251, (1995)

## Scientific Note

### THE IDENTITIES OF *ANAGRUS* (HYMENOPTERA: MYMARIDAE) EGG PARASITOIDS OF THE GRAPE AND BLACKBERRY LEAFHOPPERS (HOMOPTERA: CICADELLIDAE) IN CALIFORNIA

The grape leafhopper, *Erythroneura elegantula* Osborn, is an important pest of grape vineyards in California's Central Valley. Eggs of *E. elegantula* were reported to be attacked by *Anagrus epos* Girault (Hymenoptera: Mymaridae) and this parasitoid was believed to overwinter in eggs of *Dikrella* sp. (Homoptera: Cicadellidae) on blackberry (Doutt, R. L. & J. Nakata. 1965. J. Econ. Entomol., 58:

586). Subsequently, it was concluded that the close proximity of blackberry plants to vineyards would improve parasitism of *E. elegantula* eggs on vines (Doutt, R. L., J. Nakata & F. E. Skinner. 1966. Calif. Agric., 20(10): 14–15).

In the 1980s the variegated leafhopper, *E. variabilis* Beamer, replaced *E. elegantula* in importance. Parasitism of eggs of *E. variabilis* was much lower than that of *E. elegantula* (Settle, W. H. & L. T. Wilson. 1990. J. Anim. Ecol., 59: 877–891), which led to the current investigation of the mymarid egg parasitoids. As a part of the above-mentioned study, mymarid wasps were reared from different leafhopper species and screened for parasitism of *E. elegantula* eggs (Doutt, R. L. & J. Nakata. 1973. Environ. Entomol., 2: 381–386). Specimens of *Anagrus* Haliday from this collection, stored at the University of California, Berkeley (hereafter CISC), were examined. My taxonomic investigation of the material revealed at least two species of *Anagrus* with different host associations that had been previously identified as *A. epos*.

*Anagrus* sp. "A" was reared from *E. elegantula* eggs on both cultivated and wild grapes. This species has five sensory ridges on the antennal club and therefore belongs to the *incarnatus* species-group of *Anagrus* (Chiappini, E. 1989. Boll. Zool. Agr. Bachic., II, 21: 85–119). *Anagrus* sp. "B," which was reared from eggs of *Dikrella* sp. on blackberry, has three sensory ridges on the club and belongs to the *atomus* species-group of *Anagrus* as defined by Chiappini (1989).

Specimens of *Anagrus* sp. "A" are somewhat similar to the original description of *A. epos* (Girault, A. A. 1911. Trans. Am. Entomol. Soc., 37: 253–324), which is also a member of the *incarnatus* species-group. However, because of the existing uncertainty about the identity of *A. epos*, it is appropriate to call the examined material of *Anagrus* sp. "A" *A. sp. near epos* Girault. To better clarify taxonomic separation of these specimens, *A. epos* should be thoroughly redescribed from a good series of fresh specimens collected in its type localities (Centralia and Urbana, Illinois) and *Anagrus* sp. "A" compared to *A. epos*.

*Material Examined.*—*Anagrus* sp. "A": CALIFORNIA. FRESNO Co.: Kingsburg, 15–20 Apr 1965, J. Nakata, suction trap in vineyard, multiple females and males. KERN Co.: Delano, 7–21 Aug 1961, R. L. Doutt, *E. elegantula* on grape, multiple females and males. MERCED Co.: Delhi, 7 Aug 1961, R. L. Doutt, *E. elegantula* on grape, 1 female; same data except McConnell St Pk, 28 Jul, 25 Oct, and 1 Nov 1961, multiple females and males; same loc., 24 Jul 1961, R. L. Doutt and F. E. Skinner, on wild grape, multiple specimens. STANISLAUS Co.: Ceres, 13 Oct 1961, R. L. Doutt, *E. elegantula* on grape, 2 females, 3 males; same loc., 24 Jul 1961, R. L. Doutt and F. E. Skinner, 7 females, 1 male; same data except on wild grape, 4 males. TULARE Co.: Exeter, 7 Aug 1961, R. L. Doutt, *E. elegantula* on grape, 5 females, 3 males. *Anagrus* sp. "B": CALIFORNIA. FRESNO Co.: Laton, Cole Slough, 13–31 Mar 1963, J. Nakata, on *Rubus*, 17 females. MADERA Co.: Madera, 25 Feb 1963, J. Nakata, on *Rubus*, 3 females. SAN JOAQUIN Co.: Manteca, Caswell Mem St Pk, 29 Apr 1963, R. L. Doutt, by suction machine on *Rubus*, 3 females. TULARE Co.: nr Kingsburg, Kings River at Mt View Ave, 23 Jan 1963, J. Nakata, ex. cage of *Rubus*, 2 females; same data except Feb 1963, 3 females; Exeter, 11 Mar 1963, J. Nakata, on *Rubus*, 9 females [all in CISC].

*Acknowledgment.*—I thank Robert Zuparko for the loan of material and Kent M. Daane for the review of the manuscript.

Serguey V. Trjapitzin, Department of Entomology, University of California, Riverside, California 92521-0314.